

KLINOV, I.Ya.; FABRIKANT, T.L.

Carbon tiles for the lining of digesters in the sulfite
pulp industry. Trudy MIKIM 28:221-227 '64.

(MIRA 19:1)

An intense light source for photographic purposes.
V. A. Finkelman and A. M. Sherman. J. Tech. Phys.
(U. S. S. R.) 6, 601-61 (1934). A flash lamp consisting of
-Alitol in an atm. of O and giving 400,000 candle power
is described. Atdn. of 2% Alitol raises this to 500,000
candle power. The duration of the flash is, say, 0.02
to 0.04 and 0.01 to 0.02 sec. P. H. Kuthmann

APPROVED FOR RELEASE: Thursday, July 27, 2000

CIA-RDP86-00513R000412320

643
OPTICAL INVESTIGATION OF THE DISCHARGE IN
METALLIC VAPOURS. 1. THE RELATION BETWEEN
THE CONCENTRATION OF EXCITED ATOMS AND THE
CURRENT INTENSITY IN A HIGH PRESSURE MERCURY
DISCHARGE. (Optische Untersuchung Der Entladung in
Metalldampfen I Die Abhängigkeit Der Konzentration
Angeregter Atome Von Der Stromstärke In Der

Hochdruckquecksilberentladung). Y. A. Fabrikant and
[V. I. L. Pulver. Translated from *Fizika* 2, 506 (1961) 5,
521-56 (1964). 11p. (TIB/T4132A)

The absorption and intensity of visible lines in a high-
pressure discharge were measured, with constant concen-
tration of the Hg vapor, for various current intensities
using Hg-A lamps with oxide cathodes. Constant absorp-
tion and linear increase in the intensity of the visible triplet
with increasing current intensity were established. The
results showed that the concentrations of atoms at the levels
 3^1P_1 , 3^1P_1 , and 3^1P_2 are related to each other in the propor-
tion 100 to 144 to 120 and remain constant for variations in
the current intensity from 5 to 7.5 amp. (J.A.G.)



1794.—Pressure Effect on Discharge Radiation in Mercury Vapor. V. Fubini, P. Butcher and J. Clegg. *Comptes Rendus (Doklady) de l'Acad. des Sciences, U.S.S.R.*, 4, 4-5, pp. 182-184, 1955. In German.—The non-detection of a minimum in the intensity of radiation from Hg discharges as pressure is gradually increased is discussed in relation to effects of addition of an indifferent gas, such as were observed in Cd (see Abstract 906 [1955]). In Hg + A the intensity in the visible region first remains constant and then falls off rapidly; in Hg + Ne a minimum occurs which is sharpest with very little Ne; and as in the case of Cd, A is more effective than Ne. In Hg, as in Cd, there must be considerable reabsorption of the visible triplets in a low-pressure discharge. This is verified by absorption measurements by a mirror—or autocollimation—method for Hg discharges at 10^{-4} mm. The absorption of $\lambda 4388$ ($> 66\%$) exceeds that of $\lambda 5464$, which exceeds that of $\lambda 4040$, 5770 and 5790. These high reabsorptions exceed those in a high-pressure discharge, and explain the deviations of the observed intensity ratios of the visible Hg triplets in low-pressure discharges from the ratios given by the intensity rules. W. J.

4768. Optical Properties of Mercury-Vapour Lamps. W. Fabrikant, G. Wilson and H. Auerbach. *Techn. Phys., U.S.S.R.* 3, 8, pp. 535-544, 1958. 14 refs. In English. Using a stroboscopic method it is shown that the intensity of the lines 5770 and 5790 Å varies through a much wider range during an exc. cycle than does the intensity of the visible triplet as shown by the lines 5461 and 4360 Å. The light distribution curve of the former lines also has a wider shape than that for the visible triplet, this result agreeing well with the results of absorption measurements. The method used also shows a new phenomenon, that of the variation of the shape of the light distribution curves during a cycle, the variation of the curve for the line 5461 Å being greater than for the lines 5770 and 5790 Å.

R. C. F.

100-114 METALLURGICAL LITERATURE CLASSIFICATION

[illegible]

PROCESSING AND PROPERTY INDEX

a-1

bc

Discharge radiation in vapours of metals.
V. A. FANEGANT (Dokl. Akad. Nauk U.S.S.R., 1966, 441-443). The pressure-intensity radiation curves for discharges through Hg, Cd, and Zn vapours are of the same general type, and exhibit minima, the depth of which varies as the thermal conductivity of the vapours; the minima become less marked in presence of inert gases. The curves are interpreted on the basis of reabsorption, and of variations in the no. of collisions between atoms and electrons and in the efficiency of these collisions. R. T.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

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<div style="display: flex; justify-content: space-between;"> SA B64 T </div> <p style="text-align: center;">1736. Absorption in the Mercury Discharge. W. Fabrikant. <i>Phys. Zeits. J. Sowjetunion</i>, v. 3-3, pp. 240-243, 1936. In German.— The author's observations of the absorption of the yellow lines in the Hg discharge at high pressures are compared with those of Rentschler (see Abstract 2441 (1935)), and the conclusions drawn by the latter are criti- cized. C. B. A.</p> <p style="text-align: center;">ASA-ILA METALLURGICAL LITERATURE CLASSIFICATION</p>																									

FABRIKANT, V. A.

3

1994

OPTICAL INVESTIGATIONS OF THE DISCHARGE IN METALLIC VAPOURS. 2. THE REABSORPTION OF RADIATION IN A MERCURY DISCHARGE. (Optische Untersuchungen Der Entladung In Metaldampfen). 2. Über Strahlungsreabsorption In Der Quecksilberentladung). V. A. Fabrikant and F. Butzovs. Translated from Physik. Zhurnal 9, 383-404(1956). 15p. (TID/T4133B)

The assumption that only reabsorption can influence the intensity relationships of the mercury lines with common upper levels is discussed. It is shown that all observed intensity relationships can be qualitatively explained by the influence of reabsorption. The lower limits for the reabsorption coefficients of the individual lines are determined. It is shown that the results agree qualitatively with the thermal theory of mercury discharge at high pressures. (auth)

Pa. Dr. Kanel, V. H.

4925

OPTICAL INVESTIGATIONS OF THE DISCHARGE IN METALLIC VAPOURS. 3. THE INFLUENCE OF THE PRESSURE ON THE RADIATION FROM DISCHARGES IN MERCURY AND CADMIUM VAPOUR. (Optische Untersuchungen über Entladung in Metalldämpfen. 3. Einfluss Des Druckes Auf Die Ausstrahlung Von Entladungen In Quecksilber Und Kadmiumdampf). V. A. Fakhreutdinov.

A. B. Kanel, and E. D. Dzyuba. Translated from *Fizika* 7, *Sovetskaya* 10, 315-36(1976). 13p. (THU/T4133C)

It is established that the intensities of the lines of mercury and cadmium discharge spectra vary nonmonotonously in relation to the pressure. A characteristic feature is the existence of an intensity minimum at a particular pressure. By comparing the measured results for lines with either an upper or lower common level, the part played by the reabsorption and the excitation potential could be explained. In addition, an alteration in the form of the curve for the angular distribution of the intensity was established with rising pressure. It could be shown that all the observed effects agreed well with simple theoretical estimates. (auth)

Shape of mercury lines. V. FANNIKANT and P. NITANVA (Physikal. Z. Sovietunion, 1937, 12, 761-763).—The shape of the line at 4350 Å. emitted by a high-pressure quartz Hg-vapour lamp at 10-20 atm. is measured. The line shows self-reversal which diminishes with increase in pressure while the broadening and shift increase. The mechanism of self-reversal at high pressure is different from that at low pressure. Conditions favourable for reversal are discussed. J. A. D.

J. A. D.

A 50 524 METALLURGICAL LITERATURE CLASSIFICATION

130

Absolute concentration of excited atoms in a low-pressure mercury discharge. V. FABRIK, ANT. F. BUYAJEVA, and I. CHHO (Comp. rend. Acad. Sci. U.R.S.S., 1937, 14, 423—430; of this vol., 158).—By measuring the absorption in the discharge of visible triplet lines ending at the levels 6^3P_2 i.e. the comens, at these three levels were determined, and results are discussed in relation to available calc. data. N. M. B.

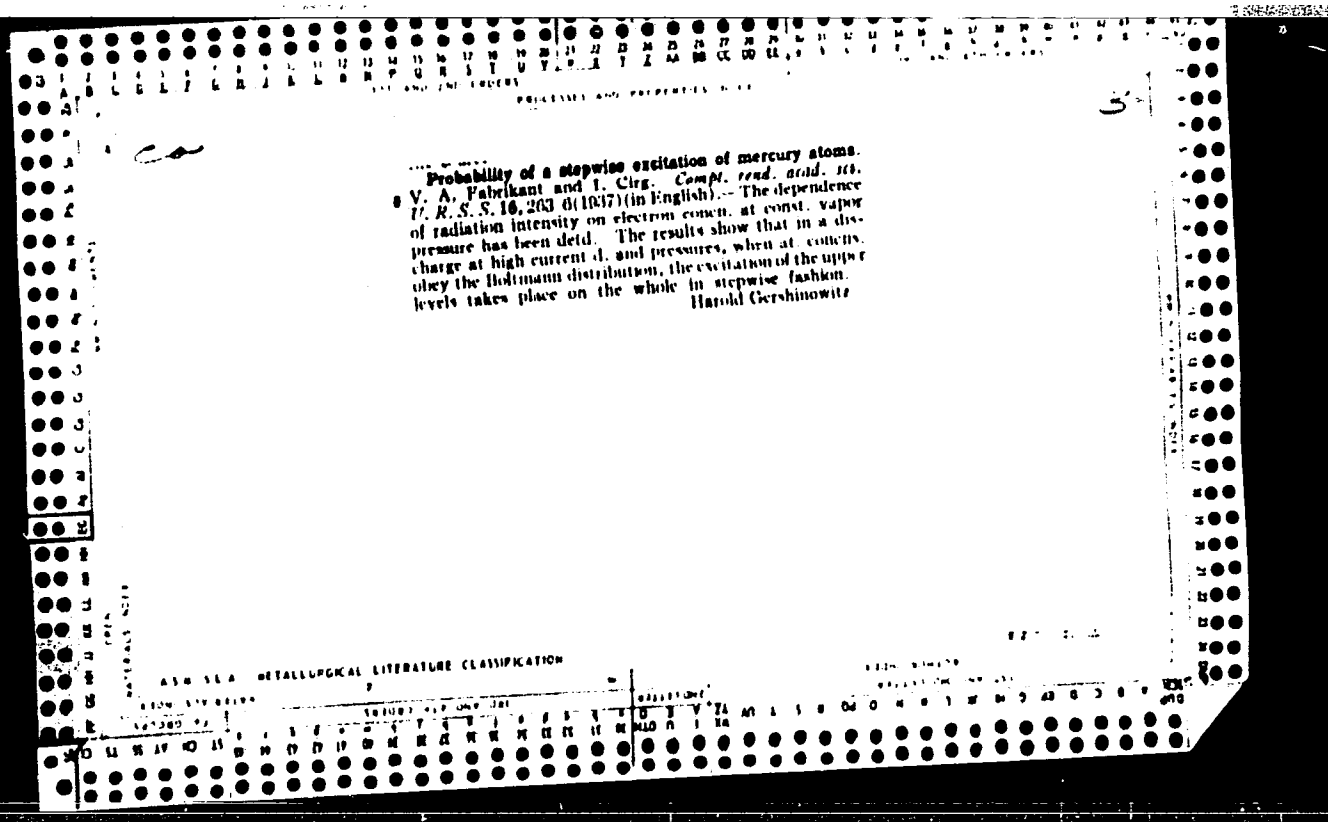
ASB 51.4 METALLURGICAL LITERATURE CLASSIFICATION

BC A-1

THEORY OF RADIATION OF A GASEOUS DISCHARGE.
V. FARMANAK. (Compt. rend. Acad. Sci. U.R.S.S.,
1937, 16, 481-483).—A method for calculating the
total intensity of radiation in a discharge such that
secondary processes can be neglected, where electron
concn. and temp. are known, is developed. The
theory agrees with the results of Druyvesteyn and
Warmoltz (A., 1934, 124) for a Na discharge.
O. D. S.

ASSOCIATE METALLURGICAL LITERATURE CLASSIFICATION

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ALPHABETIC INDEX																									
PRINCIPAL AND PRINCIPAL INDEX																									
<div style="display: flex; justify-content: space-between;"> BC A-1 </div> <div style="text-align: center; margin-top: 100px;"> <p>Probability of collisions of the second kind between atoms and free electrons. V. KARLHANTY (Comm. Acad. Sci. U.R.S.S., 1937, 17, 768-780).—Mathematical. A quant. application of the Klein-Rosseland relation is developed.</p> <p>N. M. B.</p> </div>																									
<div style="display: flex; justify-content: space-between;"> <div> <p>ALPHABETIC INDEX</p> <p>PRINCIPAL INDEX</p> </div> <div> <p>ALPHABETIC INDEX</p> <p>PRINCIPAL INDEX</p> </div> </div>																									

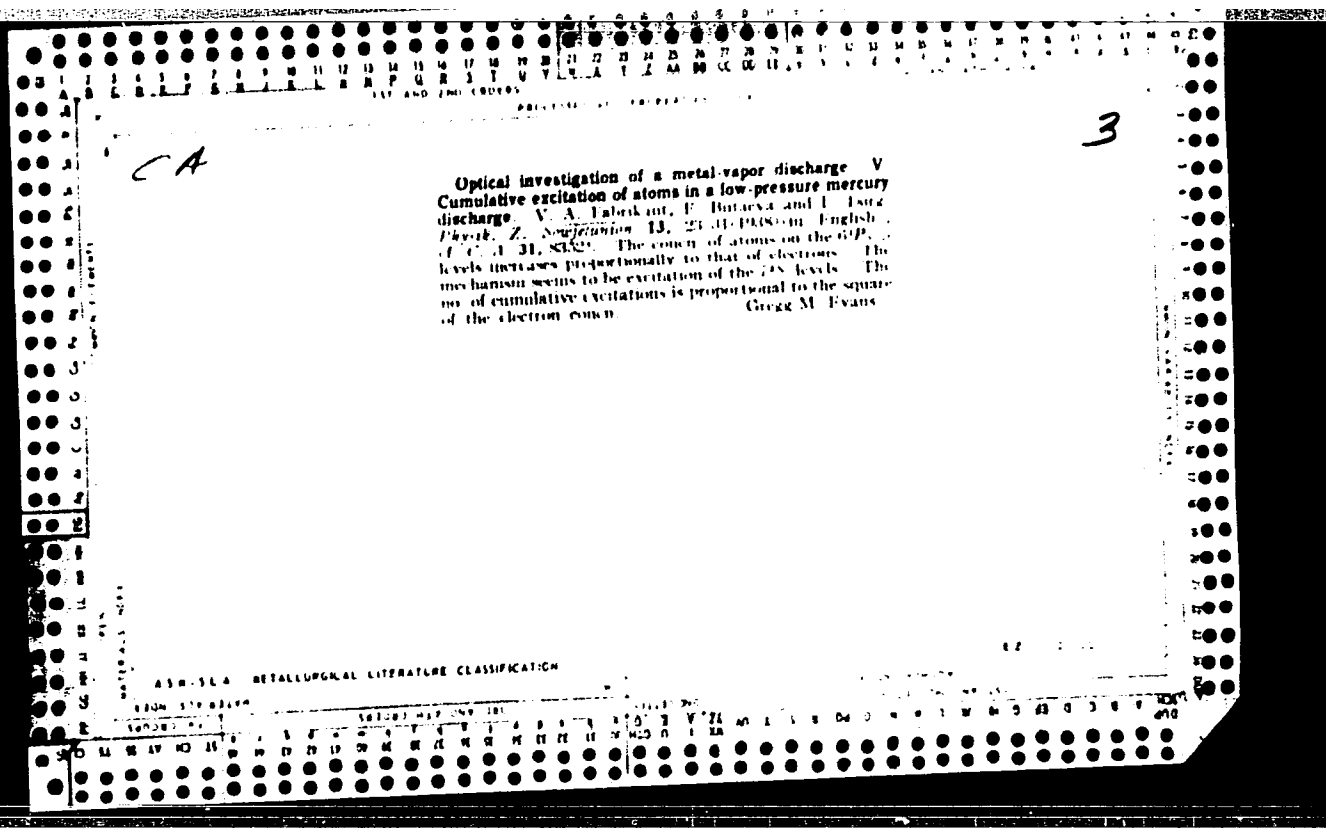
BC

Intensity of spectrum lines in the gas discharge. V. A. FARRIKANT (Bull. Acad. Sci. U.R.S.S., 1938, No. Phys., 306-323).—The abs. intensities of spectral lines calc. on the basis of elementary at. consta. and electrical data coincide with the vals. obtained by experiment. The 1850 Å. line plays an important part in the radiation of the low-pressure discharge in Hg. The quenching of spectral lines by collisions of the second kind has been quantitatively investigated. The low-pressure discharge radiation of Hg vapour is a black-body radiation. The factors determining the shape of lines in the high-pressure discharge have been examined.
A. J. M.

ASAC-SLA DETALLURGICAL LITERATURE CLASSIFICATION
RECORD SYMBOLS RECORD MAP ONLY CASE REELSTONE REELST ONE ONLY ISL

Stepwise excitation of atoms in a low-pressure mercury
discharge. V. A. Fabrikant, E. Butaeva and I. Tsing
J. Exptl. Theoret. Phys. (U.S.S.R.) 8, 359 (1948). As
in the case of results cited from absorption-measurement
data, the no. of acts of stepwise excitation is strictly pro-
portional to the sq. root of the electron concn.
E. H. Rathmann

ASH 51.8 METALLURGICAL LITERATURE CLASSIFICATION



PERIODIC TABLE										PROCESSES AND PROPERTIES INDEX									
<p>BC</p> <p>Excitation of metastable atoms in a gas discharge. V. FARRIKANY (Compt. rend. Acad. Sci. U.R.S.S., 1934, 10, 365-368).--In the discharges in Hg rectifiers the excited atoms constitute about 10% of the total and have a Boltzman distribution. At the initial moment (stationary discharge) the excited atoms are distributed over the discharge section according to Bessel's function and not uniformly (cf. Meissner and Graffunder, A., 1928, 212), and an exponential abatement in concn. occurs with time.</p> <p>F. J. L.</p>																			
ASO-5LA METALLURGICAL LITERATURE CLASSIFICATION																			
<p>GROUPS</p> <p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18</p>										<p>PERIODS</p> <p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18</p>									

BC

Excitation of radiating atoms in a gas discharge. V. FARRERMAN. (Compt. rend. Acad. Sci. U.R.S.S., 1950, 19, 283-285).—Theoretical calculations of the constant of excited radiating atoms based on the analogy between the diffusion of quanta and atoms suggested by Compton (Physical Rev., 1922, 20, 283). F. J. L.

ASB-55A METALLURGICAL LITERATURE CLASSIFICATION

SECTION	SUBSECTION	CLASSIFICATION
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BC

Effect of magnetic field on mercury discharge radiation. V. FARMAN and I. ROOHLIN (Compt. rend. Acad. Sci. U.R.S.S., 1938, 19, 393-396).—The effect of the magnetic field produced by two solenoids on the luminous discharge from a low-pressure, H₂O-cooled, liquid-cathode Hg lamp is investigated. The luminosity of the positive column is little affected by a longitudinal homogeneous field, but a non-homogeneous field increases the intensities of the lines $\lambda\lambda$ 5461, 5770—5791 Å. 6—7 times and of the resonance lines $\lambda\lambda$ 1820 and 2697 Å. 2—5 times. The magnetic field causes distortions of the electron paths and increases the no. of collisions between atoms and electrons. F. J. L.

F. J. L.

430.314 METALLURGICAL LITERATURE CLASSIFICATION

The effect of a magnetic field on mercury discharge radiation. B. V. A. Fabrikant and O. Rokhlina. *Compt. rend. acad. sci. U. R. S. S.* 20, 437-40 (1938) (in English); cf. C. A. 33, 12561. — The distribution of electrons over the discharge cross-section, within a longitudinal magnetic field, of a Hg discharge at low pressure was detd. with the optical method. A max. concn. of electrons occurs at some distance from the axis of the discharge. The decrease in mean electron energy produced by the longitudinal magnetic field was measured. L. E. Steiner

ASB-55A METALLURGICAL LITERATURE CLASSIFICATION

BC

PROCESSES AND PROPERTIES INDEX

Excitation of atoms in a rare-gas discharge.
V. FARRIKANT and K. PANEVIN (Compt. rend. Acad.
Sci. U.R.S.S., 1938, 20, 441-444).—A discussion of
the cause of the max. which is observed in the concn.
of excited atoms in a rare-gas discharge when the c.d.
is increased. J. A. K.

ADD-51A METALLURGICAL LITERATURE CLASSIFICATION

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C A

Luminescent probe in a gas discharge. V. Fabrikant. *Compt. rend. acad. sci. U. R. S. S.* 22, 570 2(1939) (in English).—The intensity of radiation emitted from different depths of the discharge tube is strongly affected by absorption in the body of discharge (this is particularly true for resonance lines), so that only very indirect conclusion can be drawn from such observations. To avoid this difficulty, small luminescent probes can be introduced within the tube, which, transforming the wave length of incident radiation, permit it to escape without strong absorption. By varying the type of luminophorus and the mode of observation (spectral device or stroboscopic method) fairly good results can be obtained concerning the intensity of different spectral lines emitted in the discharge. A simple formula for the difference of intensities observed on the 2 sides of an eccentrically placed probe is obtained on the basis of analogy between the diffusion of photons and that of atoms. The measurements were carried out in a mercury lamp at a vapor pressure of about 10^{-2} mm. Hg with a current of 3 amp. and a tube diam. of 28 mm. The probe (3×10 mm.) coated with willemite (max. luminescence yield at 2500 Å.) was moved across the tube by a magnetic device. The curves obtained for the intensity of the Hg line 2537 Å. at different depths of the discharge body are given.

Roksalana Gamow

Rokanlana Gamow

ASB.36A METALLURGICAL LITERATURE CLASSIFICATION

Excitation of atoms in a gas discharge V. A. Fabry
Ann. Phys. (Paris) 1928, 15, 211-218
 (1928) (in English). Cf. *ibid.* 1928, 15, 211-218.
 6137. Corrections are computed mathematically for
 previous calcs. involving excitations of atoms in a gas
 discharge where the assumption had been made that the
 concn. of excited atoms or photons on the walls of the
 discharge tube equaled zero. Recourse is had to the more
 precise boundary conditions used for the soln. of diffusion
 problems connected with excitation of atoms in a gas dis-
 charge. George Auer.

1st and 2nd orders

PROCESSES AND PROPERTIES

BC

1

Distribution of electrons over the section of a gas discharge. V. FABRIKANT (Compt. rend. Acad. Sci. U.R.S.S., 1939, 24, 631-633).—Theoretical. The influence of cumulative ionization and of vol. recombination on the distribution of electrons has been studied. The first effect is small but the second may become large, especially near equilibrium temp. O. D. S.

ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION

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1ST AND 2ND ORDERS										PROCESSES AND PROPERTIES INDEX									
<p>BC</p> <p>17-1</p> <p>Probability of excitation of a potassium atom. V. FARRUKHAN (Compt. rend. Acad. Sci. U.R.S.S., 1939, 28, 663—664).—From the data of the preceding paper, the effective cross-section of the K atom for excitation by electron impact is calc. as 2.0×10^{-16} sq. cm. L. J. J.</p>																			
ASB-55A METALLURGICAL LITERATURE CLASSIFICATION																			
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Luminescing probe in a gaseous discharge. F. A. Butaeva and V. A. Fekhtman. *Bull. Acad. Sci. U. R. S. S., Ser. Phys.* 4, 125-7 (1940); cf. preceding abstr. - The method of luminescing probes was employed for the detailed study of radiation density of the line 2537 Å. in a Hg discharge tube (diam. 30 mm, $I = 3$ amp.) at 3 different pressures (1, 3 and 6.5×10^{-1} mm. Hg). The observed curves show a slight asymmetry, which is due to minute absorption of the luminescent radiation in the body of the discharge. From two curves, photographed from the opposite sides of the tube, are obtained symmetrical curves representing real distribution of radiation density within the tube. The variations of radial energy flow can be obtained by differentiating density curves. The comparison of observed curves with the theoretical expressions based on the analogy between diffusion of photon and of atom showed that this analogy can be used only up to a certain limit. Roksalana Gamow

ADD-51.4 DETAILING LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX																									
<p>Effect of a longitudinal magnetic field on the positive plasma column of an arc. <i>V. A. Kulshammer, unpubl. read Acad. Sci. U. S. S. R. 29, 558 (1940) (in English)</i>. By use of the boundary condition that the flux of ions is zero from the walls of the tube, the following equation is derived $d \ln n / dr = -(2/\bar{C}_p) (D_e - D_p)$ where n = concn. of ions, D_e = ambipolar diffusion coeff., D_p = ion diffusion coeff., and \bar{C}_p = sp. heat. The effect of a longitudinal magnetic field may be to decrease D_e and thus lead to an abrupt drop in the concn. from the tube axis in the direction of the walls. The influence of magnetic fields on ion mobilities is small. However, electron mobilities are strongly affected and the movement of electrons in the direction of the walls is hindered. Under sufficiently strong fields the above boundary condition may be applied to electrons instead of ions. This leads to the idea that electrons and ions exchange roles when the diffusion coeff. for electrons in a direction perpendicular to the magnetic field becomes less than D_p. E. A. Gulbransen</p>																									
<p>ASD-51A METALLURGICAL LITERATURE CLASSIFICATION</p>																									
<p>120000 #2 120000 #2</p>																									

Resonant radiation of a discharge in a mixture of mercury vapor and argon. P. Butaeva and V. A. Pashkevich. *Bull. Acad. Sci. U.S.S.R., Ser. Phys.* 9, 2312 (1945). A quartz probe with luminescent willemite screen is introduced into the discharge tube. Part of the screen is covered by a filter transparent to line 2537 Å, and absorbing line 1849 Å. The diam. of the tube was 31 mm, the current 0.35 and 3 amp. The ratio of the intensities of the lines 1849 Å and 2537 Å decreased with increasing pressure in accordance with the theory. In a mixt. of Hg and 4 mm. A the ratio is decreased 2.7 times as the electron temp. (measured with Langmuir probes) decreases from 18,000 to 13,000°K. The ratio decreases also when the current is raised from 0.35 to 3 amp. This is attributed to the increase of 2537-Å. radiation by secondary processes involving metastable states. S. Pashkevich.

ASD-11A METALLURGICAL LITERATURE CLASSIFICATION

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FUNDAMENTALS 538.1																									
530.1 -- 82													2758												
Contemporary physics and energetics. FARRINGTON, V. A. <i>Elektricheskoe</i> (No. 5) 3-8 (1946) <i>in Russian</i> .--																									
<p>A general survey of contemporary physics is given. The basis of modern physical science rests on de Broglie's formula: $\lambda = h/mv$ and Einstein's law: $E = mc^2$. Principles of wave mechanics are explained with the help of conceptions of potential barrier and "tunnel effect." A physical picture of electric currents in conductors is presented: electrons move freely in insulators and conductors alike, but react only in the latter when an electromagnetic field is applied. The indeterminacy principle is discussed and applied in the concrete example of utilization of the outer electron surfaces of carbon atoms (chemical energy); the result agrees with the known thermal yield of burning coal. The present state of nuclear physics and atomic disintegration is surveyed. A. L.</p>																									
<p>ASB-5LA METALLURGICAL LITERATURE CLASSIFICATION</p>																									

[illegible]

C.A.
1951

Luminescent probes and diffusion of radiation in gases.
Y. F. Zhuravskiy. Zhur. Eksp. Teor. Fiz. 17, 1037-48 (1947).
 Present methods of measurements of the radiation emitted
 in gaseous discharges are vitiated particularly by diffusion
 and absorption taking place in the bulk of the gas, and con-
 sequently fail to provide information about the distribution
 of the radiation in the vol. The method of luminescent
 probes has the important advantage that the luminescence
 the wave length of which does not coincide with the reso-
 nance wave length of the gas, is not absorbed in the gas.
 Formulas are derived relating the brightness of vol. d.,
 luminescent probes with the microscopic characteristics of vol. d.,
 Poynting vector, and the radiation flux divergence, and the
 microcharacteristics of the mean free path of the photons,
 the concn. of the emitting atoms, and the no. of excitations
 acts. These magnitudes are functions of the coordinates
 of the point at which the probe is placed, and, consequently,
 measurements of the brightness of the luminescence permit
 the establishment of the form of these functions. The ef-
 fects of nonexponential decay of the luminescence, and of the
 perturbation brought in by the probe, are assessed.
 N. Thon

1. FABRIKANT, V. A.
2. USSR (600)
4. Physics and Mathematics
7. Collision of Electrons and Ions with Atoms of a Gas, L. A. Sena.
(Leningrad-Moscow, State Technical Press, 1948) Reviewed by
V. A. Fabrikant, Sov. Kniga, No. 8, 1949.

9. [REDACTED] Report U-3081, 16 Jan. 1953. Unclassified.

FABRIKANT, V. A. and STRONG, J.

Practice of the Modern Physics Laboratory. Translated from the English under the editorship of Prof. V. A. Fabrikant. Glavpoligrafizdat, Main Polygraphic Publishing House, 1948, 443pp,. 1952.

CA

3

Influence of the parameters of the discharge on the intensities of the mercury resonance lines 1850 and 2537 Å. F. A. Butaeva and V. A. Fabrikant. *Zhur. Tekh. Fiz.* 18, 1127-35 (1948); cf. *C.A.* 43, 6905i. — The intensities i were measured under Hg vapor pressures from 0.0002 to 0.026 mm. Hg, at 2 current intensities, 0.25 and 2.5 amp., with the aid of a luminescence spectrophotometer, with visual and photoelec. estn. of the brightness. In terms of the pressure, the ratio of i of the line 1850 Å. at 2.5 and at 0.25 amp. remains const. over the whole range, and approx. = 10, i.e. equal to the ratio of the current intensities. For the line 2537 Å., that ratio of i falls with increasing pressure, from over 30 to about 5. At 0.003 mm. Hg, i of 2537 increases more rapidly than the current; at 0.013 the increase is linear with the current, and at 0.026 it is slower than linear. At any of these pressures, the increase of i of 1850 is proportional to the current. At const. current intensity, 0.3 amp., and varying pressure, the max. of i of 1850 lies at lower pressures than that of 2537. Addn. of 4 mm. A increases i in both cases, but causes a shift of the max. (to lower pressures) only for 2537, not for 1850. Under these conditions, the max. of i of both lines lies at the same pressure of the Hg vapor, 6.5×10^{-4} mm. The simple proportionality between i and the current intensity for the line 1850 is due to the simple excitation mechanism of that line. It undergoes quenching only at high pressures. N. Thon

1ST AND 2ND SERIES		PROCEDURES AND PROPERTIES INDEX		357.32 : 357.372		A 53	
SA		<p>286. The influence of discharge parameters on the intensity of lines 1850 and 2537 Å in luminous lamps. P. A. BUTARYA AND V. A. FASHEVANT. <i>Izv. Akad. Nauk, SSSR, Ser. Fiz.</i>, 13 (No. 2) 271-4 (1949) In Russian.</p> <p>Reference is made to previous papers [Dokl. Akad. Nauk, SSSR, 27, 654 (1940); <i>J. Tech. Phys.</i>, 14, 1175 (1944)] dealing with the part played by the line 1850 Å in the excitation of luminophores in fluorescent tubes. The absorption in air of that line influencing the accuracy of research, new measurements have been carried out with the use of a vacuum monochromator. The influence of (1) current intensity, (2) vapour pressure of Hg, and (3) presence of A, on the intensity of lines 1850 and 2537 Å, and the relative sensitivity of luminophores to the light of these two wavelengths have been examined. The relationship between current intensity and the intensity is linear in the case of the line 1850 Å, and rather complicated in the case of the line 2537 Å. Changes in vapour pressure produce maxima for both wavelengths. In the presence of A identical conditions are optimal for the generation of both resonance lines, and these conditions correspond to usual working conditions in fluorescent tubes. Light sensitivity to lines 1850 and 2537 Å of crystalline luminophores has been compared with that of such luminophores as machine oil, mesculin, rhodamine, uranium glass. [See also Abstr. 2521 (1949)].</p>					
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FABRIKANT, V. A

12/12/1949

USSR/Physics

Electron Diffraction

Electron Microscopy

May 49

"Alternate Diffraction of Flying Electrons," L. Fiberman, N. Sushkin, V. Fabrikant,
Moscow Power Eng. Inst. imeni V. M. Molotov, 2 pp
"Dok Ak Nauk SSSR" Vol LXVI, No 2

Experiments on diffraction of electrons are usually carried out in powerful beams. Experience has shown the diffraction picture is independent of the intensity of the electron beam. On this basis, an imaginary experiment is discussed in terms of quantum mechanics in which electrons are diffracted one by one and wave properties are ascribed to each particle. At present there can hardly be any doubts as to the correctness of this assumption; however, importance of experiments on diffraction of particles is so great that there is some point in carrying out an actual experiment on diffraction of single electrons. Describes such an experiment, using a modified electron microscope, type EM-100. Includes two photographs. Submitted by Acad S. I. Vavilov, 16 Mar 49.

FABRIKANT, V. A

USSR/Nuclear Physics - Atoms, Excitation of Oct 51

"Excitation of Atoms in Mercury Discharge," V. Fabrikant, B. Yavorskiy, Moscow Power Eng Inst

"Zhur Eksper i Teoret Fiz" Vol XXI, No 10, pp 1180, 1181

Authors refer to work by Kagan and Perkin ("Iz Ak Nauk SSSR, Ser Fiz" 14, 1950) in which the latter quotes inaccurately results by Yavorskiy and Fabrikant. Nevertheless exptl results by Kagan

LC 1977101

USSR/Nuclear Physics - Atoms, Excitation of (Contd) Oct 51

and Perkin confirm qualitatively results previously obtained by different method by Fabrikant, Butayeva and Tsire (ibid. 7, 1937; 8, 1938). Submitted 20 Apr 51.

LC

1977101

337.523
6536. The concentration of excited atoms in a mercury discharge. YU. M. KAGAN AND N. P. PENKIN.
Izv. Akad. Nauk, SSSR, Ser. Fiz., 14, 721-6 (No. 6, 1950) In Russian.

On the excitation of atoms in the class of mercury.
V. FABRICANT AND B. YAROVSKII, *Zh. Eksp. Teor.*
Fiz., 11, 1182-3 (No. 10, 1951) In Russian.

On the excitation of atoms in the class of mercury.
YU. KAGAN AND N. PENKIN. *Ibid., 1182-3. In Russian.*

USSR/Physics - Light

MAY 51

"S. I. Vavilov's Book 'The Microstructure of Light,'" V. A. Fabrikant

"Uspekh Fiz Nauk" Vol XLIV, No 1, pp 117-135

Gives short exposition of main contents of book

"Mikrostruktura Sveta" (Microstructure of Light)

published in Moscow by Acad Sci USSR in 1950; 198 pp.

Discusses exptl investigation of fluctuations in light by visual methods; premises and certain conclusions of elementary sci of light interference;

properties of light emitted by absorbing media.

183794

USSR/Physics - Light (Contd)

MAY 51

Vavilov's book shows comparatively simple methods can be used to investigate complex phenomena. Thus Vavilov shows how study of luminescence of complex moles can explain properties of elementary radiators.

FABRIKANT, V. A.

183794

1. FABRIKANT, V. A.
2. USSR (600)
4. Physics and Mathematics
7. Works on Anomalous Dispersion in Vapors of Metals, D. S. Rozhdestvenskiy;
S. E. Frish, Corr-Mem Acad Sci USSR (editor); N. P. Penkin (commentator).
("Classics of Science", Acad Sci USSR Press, 1951). Reviewed by
V. A. Fabrikant, Sov. Kniga, No. 7, 1952.

9. [REDACTED] Report U-3081, 16 Jan 1953, Unclassified.

1. MESHKOV, V. V.: IVANOV, A. P.: KIRELLIN, V. A.: GLAZUNOV, A. A.: PANTYUSHIN, V. S.:
ZOLOTAREV, T. L.: BABIKOV, M. A.: ~~FABRIKANT, V. A.~~ ZHDANOV, G. M.: PEREKALIN, M.A.:
KOMAR, V. G.: TALITSKIY, A. V.:

2. USSR (600)

4. Kaganov, I. L. 1902-

7. Professor I. L. Kaganov; fiftieth birthday anniversary.
Elektrivhestvo, No.11, 1952.

9. Monthly List of Russian Accessions, Library of Congress, February 1953, Unclassified.

FABRIKANT, V. A.

USSR/Physics - Bibliography

Jan 52

"Bibliography," V. A. Fabrikant, L. Biberman

"Uspekhi Fiz Nauk" Vol XLVI, No 1, pp 134-138

D. N. Lazarev, "Ultraviolet Radiation and Its Application" Leningrad/Moscow, 1950, 119 pp. Favorable review.

S. Chandrasekhar, "Radiation Transfer" Oxford, 1950, 393 pp. Allegedly appropriated methods of V. A. Ambartsumyan. Despite some deficiencies still useful. [sic]
List of 62 new Russian books in physics, pp 139-144.

209T104

USSR/Physics - Book Reviews

May 52

"Bibliography: Reviews of Two Soviet Books," V. Fabrikant and M. Radovskiy

"Uspekh Fiz Nauk" Vol XLVII, No 1, pp 150-158

V. Fabrikant reviews favorably S. I. Vavilov's book "Eye and Sun (On Light, Sun, Vision)," 5th edition, revised and corrected; published by scientific-popular section of Acad Sci USSR Press, Moscow/Leningrad; 1950, 122 pp, 25,000 copies, 4 rubles. M. Radovskiy reviews favorably historically important book "Theory of Electricity and Magnetism," by F. U. T. Epinus /member of Berlin Academy, died 1883/, editing and comments by Prof 219T79

Ya. G. Dorfman; published as part of "Classics of Science Series" by Acad Sci USSR Press, 1951, 564 pp, 26.50 rubles.

FABRIKANT, V.

219T79

1. FABRIKANT, V. A.
2. USSR (600)
4. Electric Discharges through Gases
7. "High pressure mercury vapor discharge (in English). W. Yelenbaas. Reviewed by V. A. Fabrikant. Usp.fiz.nauk, 48, no. 4, 1952.

9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

CHILIKIN, M.G.; KIRILLIN, V.A.; POLIVANOV, K.M.; ~~FABRIKANT, V.A.~~;
NILENDER, R.A.; KAGANOV, I.L.; IVANOV, A.P.; ZHDANOV, G.M.

Professor V.V.Meshkov. Fiftieth birthday and 25 years of
scientific and teaching activity. Elektrichestvo no.1:93
Ja '54. (MLRA 7:2)
(Meshkov, Vladimir Vasil'evich, 1904-)

USSR/ Scientists - Book review

Card 1/1 Pub. 124 - 37/40

Authors : Fabrikant, V. A., Professor

Title : Publication of S. I. Vavilov's works

Periodical : Vest. AN SSSR 1, 123-127, Jan 1955

Abstract : The publication of several volumes of Academician S. I. Vavilov's works is announced. The manuscripts, dealing mostly in physics (quantum nature of luminescence, applicability of the Einstein law to luminescence, etc.), are reviewed.

Institution :

Submitted :

FABRIKANT, V.A., professor, doktor fiziko-matematicheskikh nauk.

Some physical problems of the origin of light. Svetotekhnika 1
no.6:3-7 D '55. (MLRA 9:4)

1. Moskovskiy energeticheskiy institut.
(Light)

FAERIAN

⁸
LEVEDEVA, V.V.; FABRIKANT, V.A.

Intensity correlations in the visible triplet of mercury. Izv.
AN SSSR. Ser. fiz. 19 no.1:7-8 Ja-F '55. (MLRA 8:9)

1. Moskovskiy energeticheskiy institut imeni V.M.Molotova i
Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta
imeni M.V.Lomonosova
(Spectrum analysis) (Spectrometer)

FABRIKANT, V.A. Dr. Phy-Math. Sci.

"Success in Luminescence," from the book Modern Military Technology, 1956, page 217.
Translation 1114585.

FABRIKANT, V.A.

GUREVICH, M.M., professor; KARYAKIN, N.A., professor; MESHKOV, V.V.,
professor; SOKOLOV, M.V., professor; TIKHODEYEV, P.M., professor;
~~FABRIKANT, V.A.~~ professor; IVANOVA, N.S., kandidat tekhnicheskikh
nauk; SHNEYBERG, Ya.A.; YUROV, S.G.; ASHKENAZI, G.I., inzhener.

Professor L.D. Bel'kind; on his sixtieth birthday. Svetotekhnika
2 no.5:26 S '56. (MLRA 9:11)

(Bel'kind, Lev Davidovich, 1896-)

FABRIKANT, V.A.

535 112
 176 INVESTIGATIONS USING LUMINESCENT PROBES
 RANGE 400-1200 Å. V.A. FABRIKANT and V.A. POKHODIN
 Zh. tekh. fiz. 40, 13, No. 4, 1974, 2255-2261
 In these experiments a discharge tube was used
 with He, Ne, Ar at pressures of about 1 mm Hg.
 The tube consisted of a wire covered with Mo sulfide
 which gives a green emission readily excited by
 the radiation of the discharge. An electrodeless
 probe to be moved across the positive column.
 The intensity of the probe's emission when excited
 by the radiation of the discharge was measured
 optically. The probe was moved across the
 discharge from 0.01 to 1 Å. Luminescent probes used
 to determine the volume density of the radiation from the gas, the
 magnitude and direction of the Umov-Poynting vector and the
 divergence of the radiation flow at each point of the radiating volume.
 In the experiments it was found that the distribution of the volume
 density of the emission depends only to a small extent upon the
 nature of the gas and the discharge conditions. The volume
 density of radiation at the edge of the discharge enables a rough estimate to be made of the
 paths of photons.

РАБОТНИК, В.А.

Investigation by means of [unclear]
[unclear] 1100-A. [unclear] [unclear]
Soviet Phys. Tech. Phys. [unclear]
[unclear] - See CA 83, 150027

FABRIKANT, V.A., doktor fiz.-mat. nauk, prof.

~~Forty years of Soviet physical optics. Svetotekhnika~~ 3 no.11:3-9
N '57. (MIRA 10:12)

1. Moskovskiy energeticheskiy institut.
(Optics, Physical)

FABRIKANT, V. A.

NETUSHIL, A.V., doktor tekhnicheskikh nauk, professor; FABRIKANT, V.A.,
doktor fizicheskikh-matematicheskikh nauk, profesor.

G.R. Kirchhoff. Elektrichestvo no.10:71-73 0 '57. (MLBA 10:9)

1. Moskovskiy energeticheskiy institut.
(Kirchhoff, Gustav Robert, 1824-1887)

Fabrikant, V. A.

48-4-24/48

SUBJECT: USSR/Luminescence

AUTHORS: Butayeva F. A. and Fabrikant V.A.

TITLE: Sensitivity of Luminophores for Luminescent Tubes to Ultra-violet Radiation of Short Wavelengths (Chuvstvitel'nost' lyuminescentnykh lamp v korotkovolnovom ul'trafioletovom izlucheni)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1957, Vol 21, # 4, pp 541-543 (USSR).

ABSTRACT: The relative sensitivities of tube luminophores to mercury lines of 1,850 and 2,537 Å were directly measured. A specially designed vacuum monochromator was used. The brightness of the luminophores at their excitation by the 1,850 and 2,537 Å lines was measured by a photomultiplier. Table 1 in the article gives data for the ratio of sensitivities of these lines. Table 2 gives results of calculations of the quantum yield. These data indicate quantum yields exceeding 1 at the excitation by the 1,850 Å line. The ratio of sensitivities depends on the type of a luminophore.

Card 1/2

53-2-9/9

G.S. Landsberg as an Author and Editor of Textbooks in Physics

it already showed a marked influence on the standard of physical knowledge in high schools. According to the opinion of Landsberg even in high school physics must be taught as a science (or at least an introduction to this science) and not only as a compilation of facts and information. Studying at a high school should be arranged in such a way, that the student later on has only to increase his knowledge and is not forced to relearn everything. The textbook by Landsberg also furnishes a clear interpretation of the technical applications of physics. Among others the results of modern aero- and hydrodynamical research are taken into consideration. The second volume of the elementary textbook (High School Textbook) contains a separate chapter on semiconductors. (The first volume contains mechanics and heat, the second electricity and magnetism, the third optics and structure of the atom). The separate chapters of the "Elementary Textbook of Physics" are written by different authors, the guidance of Landsberg, however, is noticeable everywhere. According to the judgement of the examiners at the entrance examinations of the universities the students who have used Landsberg's book can be distinguished easily. Finally Landsberg's book "Optika" is described.

Card 2/3

20-3-21/60

On the Gradual Excitation of Atoms

and also by means of a photomultiplier with 13 cascades. Further details of the tests are described. A diagram illustrates one of the experimental curves for the green line 5461 Å. A weak luminescence was observed beginning at ~5 eV. The entire part of the curve lying on the left side of 7.73 eV corresponds to the acts of gradual excitation in pure form. The steep ascent of the curve at energies above 8 eV is explained by the rapid increase in the cross section for the direct excitation processes. The position of the maximum is, in comparison with the maximum of the excitation function of the level 6^3P_1 (6.6 eV), somewhat displaced to the right side.

The accurate analysis of the shape of the curve is made difficult by the fact that the exact excitation functions of the

levels $6^3P_{0,2}$ and 6^1P_1 are unknown. Preliminary measurements

showed that the intensity of the lines of the visible triplet in the domain of gradual excitation increases with the second power of the current intensity. At a constant life span of the atoms it is to be expected that such laws are prevalent on the levels 6 P. There are 1 figure and 4 references, 2 of which are Soviet.

Card 2/3

FABRIKANT, V. A.

"Optical Methods of the Investigation in Gases."

paper presented at Second All-Union Conference on Gaseous Electronics, Moscow,
2-6 October '58.

High Voltage Inst., Moscow

SOV/51-5-1-1/19

AUTHORS: Titushina, V.P. and Fabrikant, V.A.

TITLE: Investigation of the Radiation Flux Divergence of the 2537 Å Line in a Mercury Discharge (Issledovaniye divergentssii potoka izlucheniya linii 2537 Å v rtutnom razryade)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol 5, Nr 1, pp 3-9 (USSR)

ABSTRACT: Under steady-state conditions the divergence of radiation at a given point is given by the difference in the number of collisions per unit time which excite atoms and the number of collisions which de-excite these atoms. If the excited atoms are not affected by secondary processes, such as collisions of the second kind or cumulative excitation, the radiation divergence ($\text{div } G$) should be proportional to the electron density (n_e). In this case the curves of distribution of $\text{div } G$ and n_e across the discharge tube should be similar. If the secondary processes are important then the curves of distribution of $\text{div } G$ and n_e across the tube should be different. The authors investigated the 2537 Å line in a positive column of an arc discharge in low-pressure mercury vapours. Construction of the discharge tube was similar to that described by Klyarfel'd (Ref 4).

Card 1/3

SOV/51-5-1-1/19

Investigation of the Radiation Flux Divergence of the 2537 Å Line in a Mercury Discharge

The discharge tube diameter was from 32-38 mm, the length of the positive column was 450-500 mm. Measurements were made at various pressures of mercury from 2×10^{-4} to 1.5×10^{-2} mm Hg and currents from 0.2 to 2.5 amperes d.c. A vibrating luminescent probe was used with its surface parallel to the discharge-tube axis. The vibrating probe method was described in detail by Titushina (Ref 6). Div G was calculated from the brightness of the probe emission, which was measured. Simultaneously with optical measurements the authors found the electron temperature and density using Langmuir and Mott-Smith probes. Fig 1 shows the distribution across the tube of the radiation divergence (black dots) and electron density (open circles). Both these quantities are given in the form of ratios of the value at a particular point to the value at the discharge-tube axis. At low pressures (5×10^{-4} mm Hg) and $\text{div } G / (\text{div } G)_0$ curve (subscript 0 denotes the value at the discharge-tube axis) falls faster at the tube walls than the n_e / n_{e0} . At pressures of the order of 6×10^{-3} mm Hg the two curves coincide, but at higher pressures (1.5×10^{-2} mm Hg) the $\text{div } G / (\text{div } G)_0$ curve falls more slowly than the electron density. The differences between the two curves indicate that in the pressure regions around 10^{-4}

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Investigation of the Radiation Flux Divergence of the 2537 Å Line in a Mercury Discharge

SOV/51-5-1-1/19

and 10^{-2} mm Hg secondary processes are important in the mechanism of excitation of atoms to the 6^3P_1 level. At pressures of the order 10^{-4} mm Hg and discharge currents of 0.5 A the secondary processes intensified emission of radiation. At pressures near 1.5×10^{-2} mm Hg and discharge currents of 0.5 and 1 A different secondary processes are active and they quench resonance radiation. Fig 2 shows the dependence of the ratio $\text{div } G/n_e$ at the discharge-tube axis on the current. Fig 3 shows the discharge current dependence of $\text{div } G/n_e$ at a distance of $0.8 R$ (R is the tube radius) from the axis. In Figs 2 and 3 numbers 1, 2, 3, 4 refer to pressures of 5×10^{-4} , 3×10^{-3} , 6.5×10^{-3} and 1.5×10^{-2} mm Hg respectively. A short theoretical treatment of the observed effects is given. It relates the radiation divergence to the probability of primary excitation processes and the probability of secondary processes (intensification or quenching of emission) as well as to the electron density. It is concluded that the mechanism of excitation to the 6^3P_1 level is complex and it is determined by diffusion of radiation and the electron density. There are 3 figures and 6 Soviet references.

Card 3/3

ASSOCIATION: Moskovskiy energeticheskiy institut (Moscow Power Institute) 1. Radiation
SUBMITTED: July 4, 1957 --Theory 2. Discharge tubes--Properties 3. Atoms--Excitation
4. Secondary emission 5. Mercury--Applications

SOV/51-5-6-17/19

AUTHOR: Fabrikant, V.A.

TITLE: On the Theory of Experiments on Deactivation of Metastable Atoms in Collisions with Atoms or Molecules (K teorii opytov s dezaktivatsiyey metastabil'nykh atomov pri stolknoveniyakh s atomami i molokulami)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol 5, Nr 6, pp 711-712 (USSR)

ABSTRACT: Kvift and Vegard (Ref 1) studied the 5577 Å green line of oxygen emitted by metastable oxygen atoms in an electric discharge. This line corresponds to a forbidden transition $1S-3P$. The main experimental and theoretical results of Ref 1 are given in Massey and Burhop's monograph (Ref 2) who say that Kvift and Vegard's method includes many assumptions which are difficult to prove. The present author (Fabrikant) questions Kvift and Vegard's assumption that the number of exciting collisions across a cylindrical discharge tube is constant. He suggests that this assumption is incorrect since the electron concentration falls sharply at the discharge-tube walls and it is best described by the zero-order Bessel function. Fabrikant derives a formula for the mean concentration of metastable atoms $\bar{n}_a = 0.44 n_a^2 / (5.8D + Za^2)$, where n_a is the number of exciting collisions with electrons at the discharge tube axis, a is the discharge

Card 1/2

SOV/51-5-6-17/19

On the Theory of Experiments on Deactivation of Metastable Atoms in Collisions
with Atoms or Molecules

tube radius, D is the coefficient of diffusion of metastable atoms and Z is the number of deactivating collisions with atoms and molecules. Fabrikant's formula differs only by a numerical multiplier from the formula given by Kvift and Vegard (Eq. 36) and Massey and Burhop (Eq. 7, 83). When the probability of deactivation by electron collisions does not exceed the probability of diffusion by more than five or six times, Fabrikant's formula is still applicable but Z should include collisions not only with atoms but also with electrons. The number of the latter collisions would be 0.7 of the number of collisions at the axis. The paper is entirely theoretical. There are 6 references, 4 of which are Soviet, 1 Norwegian and 1 translation.

SUBMITTED: July 23, 1968

Card 2/2

22(0), 2a(0)
PHASE I BOOK EXPLOITATION
Akademiya nauk SSSR. Fizicheskii institut
Issledovaniya po eksperimental'noy i teoreticheskoj fizike [Sbornik].
(Fizika) na eksperimental'nom i teoreticheskom fizicheskom otdelenii
(fiziki) Moskvy, Izd-vo AN SSSR, 1959. 304 p. Errata slip
inserted. 2,300 copies printed.

[illegible]

PURPOSE: This book is intended for physicists and researchers engaged in the study of electromagnetic radiations and their role in the composition of materials.

CONTENTS: The collection contains 30 articles which review investigations in spectroscopy, molecular optics, semiconductor physics, nuclear physics, and other branches of physics. The introductory chapter gives a biographical profile of O. S. and the Professor and Head of the Department of Physics of the Division of Physical Technology at the Institute of Optics and reviews his work in Rayleigh scattering, resonance spectral analysis of metals, etc. article.

mentioned. References accompany each item mentioned.

Bazulin, P. A., V. I. Mal'nev, and M. M. Subchinak. The Work of O. S. Landsberg in the Field of Molecular Spectroscopy. Investigation of Trans-Formation Processes in an Activated Discharge Generator Operating Under Conditions of Low Arc Currents.

Aleksanyan, V. T., Kh. Ye. Sterin, A. L. Liberman, I. M. Kuznetsova, N. I. Tyun'kina, and B. A. Kazanakiy. The Possibility of Establishing the Configuration of Stereoisomeric Dialkyl-
of Establishing the Configuration of Stereoisomeric Dialkyl-
of Establishing the Configuration of Stereoisomeric Dialkyl-

5
cyclohexane on the basis of a comparison between
5 standing sound waves of same amplitude

Andreyev, M. R. Scattering of Electromagnetic Waves by a Randomly Rough Surface. *Radio Engng. Electron. Phys.* 1977, 22, 10, 1755-1760.

Butayeva, P. A., and V. A. Sabirskiy. A Medium With Negative
Thermion Coefficient

Abstracts of the 1964 Symposium on Nuclear Transitions in Nonspherical Nuclei
Vladimir V. V. Nuclear Transitions in Nonspherical Nuclei
Vol'kenshteyn, N. V. Optical Properties of Substances in the
Vitreous State

Vol. 2, No. 1: V. S. Vavilov and A. P. Shotov. The Question of

Impact Ionization in Semiconductors
Vul'ison, K. S. New Methods of Increasing the Effectiveness of Radiation Thermocouples

Ginsburg, V. L. and A. P. Layanuk. Scattering of Light Near
Points of Phase Transition of the Second Type and the
Critical Curie Point

Iakovlev, M. A. Irradiation of an Elastic Wall Vibrating
in the Presence of Statistically Distributed Forces

Under the Action of Steam, the Disming of Light by a Cloud

Maxim M. A. S. L. Mandel'shtam and V. G. Kolosnikov. The

Broadening and Shifting of the Spectral Lines of a Gas Discharge in Plasma

Malyshov, V. I., and V. M. Mutzin. Investigation of the Hydroxy-
phenyl-substituted Aromatic Ketones Whose Molecules Contain Two Hydroxyl
Groups. *Dokl. Akad. Nauk SSSR*, 1967, No. 10, p. 1813; Chem. Abstr., 1968,
62: 12292d.

gen bond in substances whose hydrogen groups

11

Downloaded from <http://ajph.org/> on November 10, 2015

PUTILOV, Konstantin Anatol'yevich; FABRIKANT, Valentin Aleksandrovich;
ZHABOTINSKIY, Ye.Ye., red.; KUZNETSOVA, Ye.B., red.; KRYUCHKOVA,
V.N., tekhn.red.

[Course in physics] Kurs fiziki. Moskva, Gos.izd-vo fiziko-matem.
lit-ry. Vol.3. [Optics, atomic physics, nuclear physics] Optika,
atomnaya fizika, yadernaya fizika. 1960. 634 p.
(Physics) (MIRA 14:1)

S/096/60/000/010/016/022

E194/E135

114100

AUTHORS:

Shpil'rayn, E.E., Fabrikant, V.A., Fedorova, I.P.,
Rumyantsev, A.M., and Detlaf, A.A.

TITLE:

Calculation of the Specific Heat of Alkaline Metal
Vapours

PERIODICAL: Teploenergetika, 1960, No 10, p 95

TEXT: Calculated values are given for the specific heat at constant pressure of vapours of alkaline metals and the thermodynamic functions are calculated. (Enthalpy, isobar-isothermal potential) of monoatomic and biatomic vapours in the temperature range 500 to 3500 °K for the ideal gas conditions. In determining the specific heat of monoatomic and biatomic vapours only the lower electronic level was taken into account; in calculating the static sums of biatomic vapour molecular oscillations and flexibility were allowed for. On this basis calculations were made of the constants of equilibrium and degree of dissociation of biatomic vapours of alkali metals as functions of temperature and pressure. In addition, the calculations were made in the above mentioned

Card 1/2

VB.

S/096/60/000/010/016/022

E194/E135

Calculation of the Specific Heat of Alkaline Metal Vapours
temperature range of the specific heat of a reacting mixture of
monoatomic and biatomic vapours both on the saturation line and
in the superheated vapour region.

ASSOCIATION: Moskovskiy energeticheskiy institut
(Moscow Power Institute)

Card 2/2

✓B

FABRIKANT, V.A.

"Optical pyrometry of plasmas" edited by M.M.Sobolev. Reviewed
by V.A.Fabrikant. Usp.fiz.nauk 71 no.4:688-689 Ag '60.
(MIRA 13:8)

(Plasma (Ionized gases))
(Pyrometry)

FABRIKANT, Valentin Aleksandrovich, prof., doktor fiziko-matem. nauk; CHERENKOV, Pavel Alekseyevich, prof., doktor fiziko-matem. nauk, laureat Nobelevskoy premii; GALANIN, Mikhail Dmitriyevich, prof., doktor fiziko-matem. nauk; KUZNETSOV, Ivan Vasil'yevich; TOLSTOY, Nikitja Alekseyevich, prof., doktor fiziko-matem. nauk; VINTER, Aleksandr Vasil'yevich, akademik [deceased]; BARDIN, Ivan Pavlovich, akademik [deceased]; BAZHENOV, A.I., FAINBOYM, I.B., red.; RAKITIN, I.T., tekhn. red.

Sergei Ivanovich Vavilov; sbornik. Moskva, Izd-vo "Znanie," 1961. 43 p. (Vsesoyuznoe obshchestvo po rasprostraneniю politicheskikh i nauchnykh znaniy. Ser.9, Fizika i khimiya, no.10) (MIRA 14:7).

(Vavilov, Sergei Ivanovich, 1891-1951)

FABRIKANT, Valentin Aleksandrovich, prof., doktor fiziko-matem.nauk;
PAYNBOYM, I.B., red.; ATROSHCHENKO, L.Ye., tekhn.red.

[A beam into space] Luch idet v kosmos. Moskva, Izd-vo "Znanie,"
1961. 28 p. (Vsesoiuznoe obshchestvo po rasprostraneniu politi-
cheskikh i nauchnykh znani. Ser.9, Fizika i khimiia, no.8)
(MIRA 14:7)

(Particles (Nuclear physics)) (Photons) (Masers)

27197

S/056/61/041/002/019/028
B111/B212

24.2/20

AUTHOR: Fabrikant, V. A.

TITLE: Negative absorption coefficients in discharges taking place
in gas mixtures

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41,
no. 2, 1961, 524-527

TEXT: The author examined the conditions for the occurrence of a negative absorption coefficient, taking into account the actual relations between the relevant probabilities, and sets up initial equations for the selective excitation of atoms from the lower level. The final expression obtained is

$$\frac{B_{ab}}{\beta_{k0}} \geq \frac{b_{ik} [\exp((e_i - e_k)/kT_e) + 1/b_{k0}] \eta_{ik} - \eta_{k0} - b_{ik}}{1 - b_{ik} (n_k^b/n_0^b) [\exp(e_i/kT_e) \eta_{ik} - \exp(e_k/kT_e)]} \quad (6),$$

where B_{ab} denotes the probability of collision with atoms or molecules of the admixture; β_{i0} , β_{k0} , β_{ik} denote the probability of electron collisions

Card 1/3

27197

S/056/61/041/002/019/028
B111/B212

Negative absorption coefficients in...

of the second kind; b_{ik} , b_{k0} are practically constant quantities;
 $\eta_{ik} \equiv 1 + A_{ik}/\beta_{ik}$, A_{ik} denotes the probability of spontaneous transitions;
and n denotes the concentration of atoms or molecules. The inequality
 $n_k^b/n_0^b < \exp(-\epsilon_i/kT_e)/b_{ik}$ has to be satisfied here. For selective excitation of atoms from the level ϵ_i an analogous expression is valid:

$$\frac{B_{ba}}{\beta_{i0}} \geq \frac{(b_{ik}/b_{k0})[\eta_{ik}(1+b_{k0}\exp((\epsilon_i-\epsilon_k)/kT_e))-(b_{k0}/b_{ik})\eta_{k0}-b_{ik}\exp((\epsilon_i-\epsilon_k)/kT_e)]}{\exp(\epsilon_i/kT_e)[\eta_{k0}-(b_{ik}/b_{k0})[\eta_{ik}-(n_0^b/n_i^b)\exp(-\epsilon_k/kT_e)]} \quad (13).$$

N. G. Basov, O. I. Krokhin (Ref. 1: ZhETF, 39, 1777, 1960), F. Butayeva, V. Fabrikant (Ref. 2: Issledovaniya po eksperimental'noy i teoreticheskoy fizike - Studies in experimental and theoretical physics, Sb. pamyati G. S. Landsberga, izd. AN SSSR, 1959), V. I. Ablekov, E. S. Pesin, I. L. Fabelinskiy (Ref. 3: ZhETF, 39, 812, 1960) are mentioned. There are 1 figure and 7 references: 6 Soviet and 1 non-Soviet. The reference to the English-language publication reads as follows: Ref. 6: A. Javan, W. R. Bennett, jr., D. R. Herriott, Phys. Rev. Lett., 6, 106, 1961.

Card 2/3

27197

... absorption coefficients in...

S/056/61/041/002/1:
B111/B212

ORIGINATOR: Moskovskiy energeticheskiy institut (Moscow Power
Engineering Institute)

DATE: March 7, 1961

S/048/62/026/001/005/018
B125/B104

AUTHOR: Fabrikant, V. A.

TITLE: Bouguer law

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26
no. 1, 1962, 61 - 66

TEXT: Exponential attenuation of light in an absorbing medium (Bouguer's law) is one of the most important optical laws. A survey is given on studies conducted during the past ten years in connection with the Bouguer law. The limits of its applicability are taken into account. The following names are mentioned: Vavilov S. I., (Sobr. soch., 1, 80, 1954); Butayeva F. A., Fabrikant V. A., (Zh. tekhn. fiz., 26, 749 (1956)); Titushina, V. P., Fabrikant V. A. (Optika i spektroskopiya, 5, 2 (1959)); Butayeva F. A., Fabrikant V. A. (Zh. tekhn. fiz., 18, 1127 (1948)); Biberman L. M. (Zh. eksperim. i teor. fiz., 17, 416 (1947)); Biberman L. M. (Zh. eksperim. i teor. fiz., 31, 341 (1956)); Veklenko, B. A. (Zh. eksperim. i teor. fiz., 31, 1685 (1958)); Basov, N. G. (Zh. eksperim. i teor. fiz., 27, 431 (1954), 28, 249 (1955)); Prokhorov, A. M. (Zh. eksperim. i teor. fiz., 27, 431 (1954), 28, 249 (1955)).

Card 1/2

Bouguer law

S/047/62/026/001/005/018
B 125/B 104

Basov, N. G., Krokhin, O. I. (Zh. eksperim. i teor. fiz., 30, 1777 (1960));
Vavilov, S. I., Levshin, V. L. (Sov. Z. Phys., 35, 932 (1926)); Ablekov,
Pesen, and Fabelinskiy. There are 5 figures and 23 references: 20 Soviet
and 3 non-Soviet. The two references to English-language publications read
as follows: Phelps A., McCourby A., Phys. Rev., 118, 1561 (1960);
Javan A. et al., Phys. Rev. Letters, 6, 106 (1961).

ASSOCIATION: Moskovskiy energeticheskiy institut (Moscow Power
Engineering Institute)

Card 2/2

FABRIKANT, V.A.

Discussion of R.A.Nilender's report. Izv. AN SSSR. Ser. fiz. 26
no.4:538 Ap '62. (MIRA 15:4)
(Electric lamps) (Luminescent substances—Spectra)

FABRIKANT, Valentin Aleksandrovich, doktor fiziko-matem, nauk, prof.

Optics of plasma. Nauka i zhizn' 30 no.6:33-35 Ja '63.
(MIRA 16:7)
(Plasma (Ionized gases))

PUTILOV, Konstantin Anatol'yevich, prof.; Prinimali uchastiye:
FABRIKANT, V.A., prof.; IL'YACHENKO, S.M.; ZHABOTINSKIY,
Ye.Ye., red.; MURASHOVA, N.Ya., tekhn. red.

[Physics course] Kurs fiziki. Izd.11. Moskva, Fizmatgiz.
Vol.1. [Mechanics. Acoustics. Molecular physics. Thermo-
dynamics] Mekhanika. Akustika. Molekuliarnaya fizika.
Termodinamika. 1963. 560 p. (MIRA 16:7)
(Physics)

L 61680-65 ENT(1)/EPF(n)-2/ENG(m)/EPA(w)-2 Pz-6/Pe-4/Pab-10/P1-4 IJP(c) WJ/AT
 ACCESSION NR: AP5011110 UR/0051/65/018/004/0562/0570
 533.9

AUTHOR: Uvarov, F. A.; Fabrikant, V. A.

TITLE: Experimental determination of effective probability of photon emission by plasma atoms

SOURCE: Optika i spektroskopiya, v. 18, no. 4, 1965, 562-570

TOPIC TAGS: radiating atom, Rozhdestvenskiy hook method, plasma radiation, discharge column, emission probability

ABSTRACT: The Rozhdestvenskiy hook method was used to measure the distribution of 6^3p_1 radiating atoms relative to the cross section for low-pressure discharge in mercury vapor and in a mixture of mercury vapor and argon, with an aim at checking experimentally the rigorous theory of radiation "entrapment" developed by L. M. Sliberman (ZhETF v. 17, 416, 1947) and T. Holstein (Phys. Rev. v. 72, 1212, 1947 and v. 83, 1159, 1951). The discharge tube was similar to that described by A. M. Shukhtin (Opt. i spektr. v. 7, 839, 1960) and others. The power of the 2537 Å resonant emission was measured simultaneously. The experimental procedure is described. The measurement results were used to calculate the effective probability

Cord 1/2

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ACCESSION NR: AP5011110

4
for photon emission from plasma atoms. The addition of argon to the mercury vapor increased the effective photon emission probability by a factor 1.5--2, owing to the additional broadening of the 2537 Å line by collision with the argon atoms. The probability also increases with the current, especially when argon is added, because of the redistribution of the radiating atoms relative to the discharge cross section. "The authors thank F. A. Butayeva, L. M. Biberman, B. A. Veklenko, and K. I. Rozgachev for valuable advice and help with the work." Orig. art. has: 11 figures, 5 formulas, and 3 tables.

ASSOCIATION: None

SUBMITTED: 238sep64

ENCL: 00

SUB CODE: OP, NP

NR REF SOV: 016

OTHER: 007

llc
Card 2/2

L 64512-65 EPA(s)-2/EPA(w)-2/EMI(1)/EWA(m)-2

ACCESSION NR: AP5012602

UR/0051/65/018/005/0768/0776

533.9

AUTHOR: Uvarov, F. A.; Fabrikant, V. A.

TITLE: On the absolute concentrations of excited atoms in the positive column of a mercury discharge

SOURCE: Optika i spektroskopiya, v. 18, no. 5, 1965, 768-776

TOPIC TAGS: optic transition, light excitation, excited nucleus, electric discharge radiation, gas discharge spectroscopy

ABSTRACT: The purpose of the investigation was to compare the experimentally measured concentrations of excited atoms with the results of calculations based on probe-measurement data for a wide range of discharge conditions. Unlike in earlier papers (Izv. AN SSSR, Ser. fiz. v. 9, 230, 1945 and others), the authors take into account transitions between excited states. The studies were made on low-pressure discharges in mercury vapor and in mixtures of argon with mercury vapor. Measurements of absolute concentrations of excited atoms at the levels $6^3P_0, 1, 2$ are compared with the theoretical data obtained without account of the transitions between excited states. The results show that at pressures lower than $40 \mu \text{ Hg}$ theory gives an underestimate of the concentrations of the radiating atoms and an overestimate of the concentration of the metastable atoms, compared with experiment. A theo-

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L 64512-65

ACCESSION NR: AP5012602

retical calculation which takes into account the transitions between the excited states shows that this discrepancy can be attributed to the predominance of $6^3P_2 \rightarrow 6^3P_1$ transitions over $6^3P_1 \rightarrow 6^3P_2$. When account is taken of the transitions between the excited states, the calculated values of the concentration exceeds the experimental ones. This excess is insignificant at 7μ Hg and increases strongly with pressure. A probable reason for this discrepancy is a shortage of fast electrons, brought about by inelastic collisions. Orig. art. has: 2 figures, 10 formulas, and 4 tables.

ASSOCIATION: none

SUB CODE: OP

SUBMITTED: 18Feb64

ENCL: 00

NR REF SOV: 016

OTHER: 003

Card 2/2

L 64136-65 EPT(c)/EPT(n)-2/EPA(s)-2/ET(m)/EP(t)/EP(t) TJP(c) WH/JD/JG
ACCESSION NR: AP5016166 UR/0051/65/018/006/0954/0965
537.523/.527

AUTHOR: Uvarov, F. A.; Fabrikant, V. A.

TITLE: Cross sectional distribution of excited atoms in a low-pressure discharge in mercury vapor and in a mixture of mercury vapor and argon

SOURCE: Optika i spektroskopiya, v. 18, no. 6, 1965, 954-965

TOPIC TAGS: gas discharge plasma, excited state, particle distribution, mercury, argon, plasma physics

ABSTRACT: The Rozhdestvenskiy anomalous dispersion (hook) method is used for studying the distribution of excited atoms in the cross section of a low-pressure discharge in mercury vapor and in a mixture of mercury vapor and argon. Experimental results are compared with theoretical data which take account of transitions between excited states. It was found that the distribution of radiating atoms agrees with the exact theory of L. M. Biberman and B. A. Veklenko (*Mater. Soveshch. po spektroskopii*, t. II, str. 99, Izd. L'vovsk. univ., 1958). This indicates that transitions between excited states have only a slight effect on distribution due to the strong, smoothing effect

Card 1/2

L 64136-65

ACCESSION NR: AP5016166

of diffusion in resonance radiation. On the other hand, the distribution of meta-stable atoms is sharpened considerably by $6^3P_1 + 6^3P_2$ transitions, especially in the mercury + argon discharge. In spite of qualitative agreement between experiment and theory, there are quantitative discrepancies for the mercury + argon discharge. It is possible that the cause of these discrepancies may be underestimation of the effective cross sections for $6^3P_1 + 6^3P_2$ processes and radial nonuniformity of the temperature and gas composition in the discharge column. Orig. art. has: 5 figures, 3 tables, and 10 formulas. [14]

ASSOCIATION: none

SUBMITTED: 18Feb64

ENCL: 00

SUB CODE: ME

NO REF SOV: 016

OTHER: 005

ATD PRESS: 4470

Card 2/2

UVAROV, F.A.; FABRIKANT, V.A.

Distribution of excited atoms throughout the cross section
of a low pressure discharge in mercury and mercury-argon
vapors. Opt. i spektr. 18 no.6:954-965 Je '65.

(MIRA 18:12)

FABRIKANT, Valeriy Isaakovich, assistant; STRADOMSKIY, Yuriy Iosifovich,
INZH.

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